

REMARKS

Claims 40-70 were considered in the Office action dated November 28, 2005, and were rejected under 35 U.S.C. 103(a). Applicants respectfully traverse these rejections and assert that claims 40-70 are patentable.

Independent claim 40 is patentable over **Hochman** and **Balas**

The Office action rejects independent claim 40 under 35 U.S.C. 103(a) as being unpatentable over **Hochman** (U.S. Patent No. 6,671,540) and **Balas** (U.S. Publication No. 2002/0007123). Applicants respectfully traverse this rejection because neither **Hochman** nor **Balas** teach or suggest determining a measure of dynamic similarity between two regions of tissue.

Claim 40 requires determining a measure, not simply making a qualitative comparison. Furthermore, the measure relates to a dynamic response. Step (c) of claim 40 recites, “determining a measure of similarity between two selected regions of the tissue, the measure of similarity indicating how similarly tissue in each region responds to the chemical agent” [emphasis added].

In its rejection of claim 40, the Office action states the following:

Balas does not expressly disclose step c) determining a measure of similarity between two selected regions of the tissue, the measure of similarity indicating how similarly tissue in each region responds to the chemical agent, step d) repeating step (c), thereby differentiating regions according to how tissue in each region responds to the chemical agent; and step e) locating a portion of the tissue with a characteristic of interest, the located portion corresponding to at least one of the differentiated regions.

However, **Hochman** discloses step c) determining a measure of similarity between two selected regions of the tissue, the measure of similarity indicating how similarly tissue in each region responds to the chemical agent (col. 6 lines 5-20), step d) repeating step (c), thereby differentiating regions according to how tissue in each region responds to the chemical agent (col. 6 lines 20-30); and step e) locating a portion of the tissue with a characteristic of interest, the located portion corresponding to at least one of the differentiated regions (col. 5 lines 40-65, col. 7 line 39-50).

Applicants respectfully counter that **Hochman** does not disclose determining a measure of dynamic similarity between two selected regions of tissue and, thus, does not disclose step (c) of claim 40.

At col. 6, lines 5-20, **Hochman** describes a “static mode that provides a comparison of optical properties of different spatial locations in an area of interest... Thus, following administration of a contrast enhancing agent, an area of interest believed to contain abnormal tissue may be compared to another area of interest of the same type of tissue believed to contain normal tissue [emphasis added].” There is no quantitative measure of similarity disclosed here, and there is no suggestion of obtaining a measurement of dynamic similarity.

At col. 6, lines 20-30, **Hochman** states, “a dynamic mode compares data acquired from corresponding spatial locations at various time points.” There is no quantitative measure disclosed here, and there is no suggestion of determining a measurement of dynamic similarity between two distinct regions.

Further to this point, in Example 6 (see Figures 8 and 10) **Hochman** describes tracking an optical property of an area with time. However, there is no disclosure in **Hochman** of a measure of dynamic similarity between two regions. The boundaries of regions corresponding to the traces of Figures 8 and 10 in **Hochman** do not appear to be determined using the data itself, but appear to have been selected before data is obtained. Determining a measure of dynamic similarity is not an obvious extension of **Hochman**, because the problem of quantifying dynamic similarity is complex, and there is no indication in **Hochman** of a solution.

For example, in the present application, it is desired to divide an area of tissue into regions based on the dynamic optical response of those regions to the application of a chemical agent. However, the dynamic response of a region is itself a function of how the region is defined (i.e. its location and size). As explained at paragraph [0094], page 23, to paragraph [0110], page 29, of the present application, the determination of the measure of similarity must therefore be repeated in order to differentiate regions based on dynamic similarity. This repeating appears in step (d) of claim 40, “repeating step (c), thereby differentiating regions according to how tissue in each region responds to the chemical agent”.

The Office action alleges that this repeating step, step (d), is disclosed at col. 6, lines 20-30 of **Hochman**. Applicants respectfully traverse this allegation. No such disclosure is made or suggested in the cited passage, or anywhere else in **Hochman**. As explained above, there is no quantitative measure disclosed in the cited passage, and there is no suggestion of determining a measurement of dynamic similarity between two regions.

At col. 5, lines 40-65, and col. 7, lines 39-50, **Hochman** describes how data is acquired, and in col. 5, lines 58-61, **Hochman** maintains, “[e]xamination of such data elucidates the precise spatial location of tissue abnormalities and permits characterization of abnormal tissue, such as cancerous tissue.” However, **Hochman** does not suggest any method of determining a measure of dynamic similarity, or of using such a measure to locate tissue abnormalities.

Because no combination of the cited art teaches or suggests every element of the claim, claim 40 is patentable over the cited art. Furthermore, dependent claims 41-55 are patentable since they each contain all the limitations of claim 40.

Independent claims 56 and 70 are patentable over **Hochman** and **Balas**

The Office action rejects independent claim 56 under 35 U.S.C. 103(a) as being unpatentable over **Hochman** and **Balas**. Applicants respectfully traverse this rejection because, as discussed above with respect to claim 40, neither **Hochman** nor **Balas** teach or suggest determining a measure of dynamic similarity between two regions of tissue.

As discussed above with respect to claim 40, neither **Hochman** nor **Balas** teach the steps of:

- (b) determining a measure of similarity between two selected regions of the tissue, the measure of similarity indicating how similarly tissue in each region responds to the chemical agent; and
- (c) repeating step (b), thereby differentiating regions according to how tissue in each region responds to the chemical agent.

Because no combination of the cited art teaches or suggests every element of the claim, claim 56 is patentable over the cited art. Furthermore, dependent claims 57-69 are patentable at least for this reason.

Similarly, independent claim 70 includes the steps:

- (i) based at least in part on the temporal sequence of images, determining a measure of similarity between two selected regions of the tissue, the measure of similarity indicating how similarly tissue in each region responds to the chemical agent; and
- (ii) repeating step (i), thereby differentiating regions according to how tissue in each region responds to the chemical agent.

Because no combination of the cited art teaches or suggests every element of the claim, claim 70 is patentable over the cited art.

Dependent claims 41 and 57 are patentable over **Hochman** and **Balas** in further view of **Thirion**

The Office action rejects claims 41 and 57 under 35 U.S.C. 103(a) as being unpatentable over **Hochman** (U.S. Patent No. 6,671,540) and **Balas** (U.S. Publication No. 2002/0007123) in further view of **Thirion** et al. (U.S. Patent No. 6,373,998) (see pages 11-13 of the Office action).

The Office action explains the rejection of both claim 41 and claim 57 as follows:

With regards to claim 41 [and 57], ... **Balas** (as modified by **Hochman**) does not expressly disclose step (c) further comprises merging the two selected regions into a single region if the measure

of similarity satisfies a predetermined criterion. However, **Thirion** discloses step (c) further comprises merging the two selected regions into a single region if the measure of similarity satisfies a predetermined criterion (Figure 6 item 20).

Applicants assert that none of the cited references, including **Thirion**, teaches or suggests merging two regions into a single region according to a measure of similarity, where “the measure of similarity indicat[es] how similarly tissue in each region responds to the chemical agent” as recited in claims 41 and 57. There is no disclosure in any of **Balas**, **Hochman**, or **Thirion** that teaches or suggests merging two regions into a single region based on their dynamic similarity – that is, the similarity of the dynamic response of tissue in those regions to a chemical agent.

In an embodiment of the invention of claim 41 (and 57), it is desired to divide an area of tissue into regions based on the dynamic optical response of those regions to the application of a chemical agent. However, the dynamic response of a region is itself a function of how the region is defined (i.e. its location and size). The inventions of claims 41 and 57 solve this conundrum by determining a measure of dynamic similarity between two regions, merging the regions into one new region if the dynamic similarity is sufficiently great, and repeating the process with the newly-defined regions in a step-wise fashion until a sufficient degree of consolidation and/or differentiation is achieved.

Including the limitation from the dependent claim into the independent claim from which it depends, steps (c) and (d) of claim 41 reads:

- (c) determining a measure of similarity between two selected regions of the tissue, the measure of similarity indicating how similarly tissue in each region responds to the chemical agent, and merging the two selected regions into a single region if the measure of similarity satisfies a predetermined criterion;
- (d) repeating step (c), thereby differentiating regions according to how tissue in each region responds to the chemical agent ...

None of the cited references teach or suggest this.

The Office action cites “Figure 6 item 20” of **Thirion** as allegedly disclosing, “merging the two selected regions into a single region if the measure of similarity satisfies a predetermined criterion.” **Thirion** does not teach this step. Figure 6 item 20 of **Thirion** is simply “a sampling module 20” [col. 6, line 39] in a technique for determining how a contour in one image differs from a contour in a second image. There is no comparison made in **Thirion** between the dynamic responses of tissue to a chemical agent at two different tissue locations. Moreover, even if it could be found that there was such a comparison made, the comparison is not used to decide whether to “merge the two selected regions into a single region” as recited in claims 41 and 57. Any “merging” that may be going on in the “sampling module” of **Thirion** is unrelated to the

similarity of any dynamic responses (i.e. dynamic optical response to application of a chemical agent).

As stated in the Office action, **Balas** (as modified by **Hochman**) does not disclose merging the two selected regions into a single region if the measure of similarity satisfies a predetermined criterion. Therefore, since none of **Balas**, **Hochman**, or **Thirion** (alone or in any combination) disclose all of the limitations of either of claims 41 and 57, then these claims are patentable in light of the cited art. Applicants therefore request that the rejections of these claims be reconsidered and withdrawn, at least for this reason.

Applicants reserve the right to present further arguments later, if necessary. For example, Applicants reserve the right to present arguments regarding whether the cited references cited in the 103(a) rejections can properly be combined, and Applicants reserve the right to present further arguments with respect to the rejections of the dependent claims.

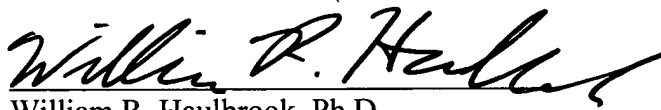
CONCLUSION

In view of the foregoing, Applicants respectfully request withdrawal of the rejections and allowance of pending claims 40-70 in due course. The Examiner is hereby cordially invited to contact Applicants' undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully submitted,

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